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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,097	10/30/2003	Lotien Richard Huang	10434/60901	2657

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EXAMINER	
FICK, ANTHONY D	
ART UNIT	**PAPER NUMBER**
1753	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,097	HUANG ET AL.	
	Examiner	Art Unit	
	Anthony Fick	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *27-42* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-42* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/13/04 5/18/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, claims 1 through 26 in the reply filed on May 18 2006 is acknowledged.

2. Claims 27 through 42 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 18 2006.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1 through 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Independent claims 1, 5, 15 and 20 all contain the limitation of "two electrodes capable of generating an electric field in the sample chamber". The further limitations of the claims require the electric field to be configured to transfer charged molecules to the inlet or from the outlet of a microfluidic channel. Utilizing electric fields to move fluids or charged molecules is well known for microfluidic devices, an example of which is a patent to Wiktorowicz et al. (U.S. 6,214,191). The level of one of ordinary skill in this art area is high as well as the predictability of this art. However the claims of

the present invention require configuration of an electric field from two electrodes within the sample chamber to transfer charged molecules to the inlet or from the outlet of a microfluidic channel. Applicant's configurations of figures 9 through 12 show the electrodes, charged particles and electric field lines. The field lines do not follow the established parallel field lines for two bar electrodes, but the bottom fields dip down into the inlet or outlet of the channel. While this representation of the lines does provide the transfer of the charged molecules to the inlet or from the outlet of the microfluidic channel, the specification does not explain the genesis of these perturbations within the electric field. Also the applicant's examples utilize a three-electrode system, and do not show the motion of charged molecules with only two electrodes. Therefore, one of ordinary skill in the art would not be able to configure the electric field of the two electrodes within the sample chamber to transfer the charged molecules. The dependent claims also contain the limitations of the independent claims and are rejected for the same reasoning.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1 through 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 1 through 26 require two electrodes capable of generating an electric field in the sample chamber and configuration of the electric field to transfer charged molecules to the inlet or from the outlet of a microfluidic channel. It is unclear how this

configuration of the field can accomplish this motion, as the fields shown in applicant's figures 9 through 12 do not follow the typical parallel field configuration for two plate electrodes.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1 through 7, 9 through 10 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Wiktorowicz et al. (U.S. 6,214,191).

Wiktorowicz discloses an integrated microfluidic device as seen in figures 3 and 4. The device comprises a microfluidic channel, 170, with an inlet and an outlet and a sample chamber, 160 and 180, comprising two electrodes capable of generating an electric field within the sample chamber wherein the electric field transfers charged molecules in the sample chamber to the inlet of the channel. Thus claim 1 is met. Also Wiktorowicz discloses the use of a polymer matrix material within the sample chamber to provide a pH gradient. The electric field elutes the charged molecules out of this polymer matrix as in claim 5. The device is utilized for several different samples as in

claims 2 through 4, 6 through 7 and 9 through 10. The device can contain a third electrode, dotted line in figure 3, as in claim 13.

10. Claims 5 through 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanbara (JP 05072178).

Kanbara discloses a microfluidic device as shown in figure 1. The device comprises a microfluidic channel, 50, with an inlet and an outlet, a sample chamber comprising two electrodes, 71 and 72, capable of generating an electric field and a section of matrix material comprising charged molecules, 6. The electric field within the chamber elutes molecules out of 6 and into the microfluidic channel. Thus claim 5 is met. The device is for DNA (abstract) as in claims 6 and 7.

11. Claims 15 through 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Mathies et al. (U.S. 6,361,671).

Mathies discloses an integrated microfluidic device in figure 1. The device comprises a microfluidic channel, 12, with an inlet and outlet, a sample chamber at the outlet of the channel, 13, comprising two electrodes, 17, 18 and working electrodes 1 through 4, capable of generating an electric field, the electrodes inherently transferring the charged molecules from the outlet and into the sample chamber onto the working electrodes. Thus claim 15 is met. A variety of samples are utilized as in claims 16 through 19.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 8, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiktorowicz as applied to claims 1 through 7, 9 through 10 and 13 above, and further in view of Adcock (U.S. 4,959,133).

Wiktorowicz discloses an integrated microfluidic device as seen in figures 3 and 4. The device comprises a microfluidic channel, 170, with an inlet and an outlet and a sample chamber, 160 and 180, comprising two electrodes capable of generating an electric field within the sample chamber wherein the electric field transfers charged molecules in the sample chamber to the inlet of the channel. The device can contain a third electrode, dotted line in figure 3. The device is utilized for several different samples. Also Wiktorowicz discloses the use of a polymer matrix material within the sample chamber to provide a pH gradient.

The differences between Wiktorowicz and the claims are the requirements of a specific matrix material, and inverted electric pulses.

Adcock teaches a method of field inversion electric pulses to force DNA or protein out of a gel and into an appropriate receiver (abstract). This method allows for the elution of higher molecular weights as in claim 8.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the gel plugs and method of elution of Adcock within the device of Wiktorowicz because the plugs and method allow for elution of higher molecular weights in shorter times. Also agarose is a common material utilized for

electrophoresis and it would be obvious to use for the gel plugs as in claim 12. Because Wiktorowicz and Adcock are both concerned with electrophoretic separation products, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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June 9, 2006